



April 30, 2008

Mr. Charles Terreni
Chief Clerk/Administrator
Public Service Commission of South Carolina
P. O. Drawer 11649
Columbia, South Carolina 29211

Re: Docket No. 2008-1-E

Dear Mr. Terreni:

Enclosed for filing in the subject docket is the direct testimony of Carolina Power & Light Company, d/b/a Progress Energy Carolinas, Inc. witnesses Bruce P. Barkley and Dewey S. Roberts, II. In accordance with Commission directive in Docket No. 2005-83-A, also enclosed is a Notice of Filing. All parties of record have been served.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Len S. Anthony', written over a horizontal line.

Len S. Anthony
General Counsel – Progress Energy Carolinas

LSA:daf

Enclosures

cc: All parties of record

262779

PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

DOCKETING DEPARTMENT

NOTICE OF FILING

DOCKET NO. 2008-1-E

CAROLINA POWER & LIGHT COMPANY d/b/a PROGRESS ENERGY CAROLINAS, INC.
- ANNUAL REVIEW OF BASE RATES FOR FUEL COSTS.

S.C. Code Ann. Section 58-27-865 (Supp. 2004) established a procedure for annual hearings to allow the Commission and all interested parties to review the fuel purchasing practices and policies of the Company and for the Commission to determine if any adjustment in the fuel cost recovery mechanism is necessary and reasonable.

On April 30, 2008 Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc. ("the Company") submitted testimony in support of a change in rates based solely on the cost of fuel during the period April 1, 2007 through February 29, 2008 and forecasted cost of fuel for the period from March 1, 2008 through June 30, 2009.

The Company has requested that the Commission adjust the base fuel factor established in Docket No. 2007-1-E by an increment of .5 cents per kWh. The current base fuel factor is 2.651 cents per kWh, and the increment is the difference between the current factor and the requested factor of 3.151 cents per kWh.

For the Residential class, the Company requested that the Commission adjust the environmental cost component by an increment of .084 cents per kWh. The current environmental cost component is .031 cents per kWh, and the increment is the difference between the current factor and the requested factor of .115 cents per kWh. The total increment requested is .584 cents per kWh, and the total increment is the difference between the total current fuel cost factor of 2.682 cents per kWh and the requested total fuel cost factor of 3.266 cents per kWh.

For the General Service (non-demand) class, the Company requested that the Commission adjust the environmental cost component by an increment of .095 cents per kWh. The current environmental cost component is .030 cents per kWh, and the increment is the difference between the current factor and the requested factor of .125 cents per kWh. The total increment requested is .595 cents per kWh, and the total increment is the difference between the total current fuel cost factor of 2.681 cents per kWh and the requested total fuel cost factor of 3.276 cents per kWh.

For the General Service (demand) class, the Company requested that the Commission adjust the environmental cost component by an increment of 18 cents per kW. The current environmental cost component is 8 cents per kW, and the increment is the difference between the current factor and the requested factor of 26 cents per kW.

For the Lighting class, the Company requested that the Commission make no change to the current environmental cost of .000 cents per kWh. The total increment requested is .5 cents per kWh, and the total increment is the difference between the total current fuel cost factor of 2.651 cents per kWh and the requested total fuel cost factor of 3.151 cents per kWh.

Public Service Commission of SC
Attention: Docketing Department
PO Drawer 11649
Columbia, SC 29211

Date: ____April 30, 2008____

**STATE OF SOUTH CAROLINA
BEFORE THE PUBLIC SERVICE COMMISSION**

DOCKET NO. 2008-1-E

In the Matter of:

Carolina Power & Light Company, d/b/a)
Progress Energy Carolinas, Inc., - Annual)
Review of Base Rates for Fuel Costs)

CERTIFICATE OF SERVICE

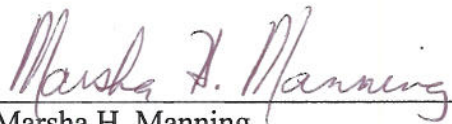
I, Marsha H. Manning, hereby certify that Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc.'s testimonies of witnesses Bruce P. Barkley and Dewey S. Roberts, II have been served on all parties of record electronically, by hand delivery or by depositing said copy in the United States mail, postage prepaid, addressed as follows this the 30th day of April, 2008:

Shealy Boland Reibold
C. Lessie Hammonds
Office of Regulatory Staff
1441 Main Street, Suite 300
Columbia, SC 29201

John Flitter
State of South Carolina
Office of Regulatory Staff
P.O. Box 11263
Columbia, SC 29211

Garrett A. Stone
Michael K. Lavanga
Brickfield, Burchette, Ritts & Stone, PC
1025 Thomas Jefferson St., NW
Eighth Floor, West Tower
Washington, DC 20007

Thomas S. Mullikin
Nucor Steel – South Carolina
Moore & Van Allen, PLLC
100 North Tryon Street, Suite 4700
Charlotte, NC 28202



Marsha H. Manning
Senior Legal Secretary to Len S. Anthony

**PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA
DOCKET NO. 2008-1-E
DIRECT TESTIMONY OF PROGRESS ENERGY CAROLINAS, INC.**

WITNESS BRUCE P. BARKLEY

1 **Q. Please state your name, address, and position.**

2 A. My name is Bruce P. Barkley and my business address is 410 S. Wilmington Street,
3 Raleigh, North Carolina. My position is Manager–Fuel Forecasting and Regulatory
4 Support for Progress Energy Carolinas, Inc. (“PEC” or “Company”)

5 **Q. Please describe your educational background and professional experience.**

6 A. I obtained a Bachelor of Science Degree in Business Administration with a
7 concentration in Accounting from the University of North Carolina at Chapel Hill
8 in 1984 and an MBA Degree from Wake Forest University in 1999. I obtained my
9 CPA license in 1987. I joined Progress Energy in the Regulatory Services Section
10 in 2001 and transferred to my current position in the Regulated Fuels Department
11 in 2005. I am responsible for fuel forecasting, reporting and associated regulatory
12 matters.

13 **Q. Have you previously presented testimony regarding fuel clauses?**

14 A. Yes, I appeared before the South Carolina Public Service Commission (“SCPSC”)
15 from 2003-2007 and in numerous fuel cases before the NCUC.

16 **Q. What is the purpose of your testimony?**

17 A. The purpose of my testimony is to review PEC’s fuel cost for the historical period
18 under review in this proceeding, April 2007 through February 2008, support the
19 reasonableness of these costs, present projected fuel cost for the period March 2008
20 through June 2009 and recommend a fuel factor to be effective July 1, 2008. I will
21 provide twelve exhibits to support my testimony. This will also include a review

1 of historical and projected environmental costs. These costs include ammonia and
2 limestone used in the process of reducing sulfur dioxide (SO₂) and nitrous oxide
3 (Nox) emissions and the costs of SO₂ and Nox emission allowances. The
4 legislation which enabled recovery of these environmental costs through an annual
5 rate rider became effective on May 3, 2007.

6 **Q. Why does PEC's review period consist of eleven months?**

7 A. This period of review was requested by the Office of Regulatory Staff (ORS). I
8 believe the ORS' request was prompted by the relatively short time between the
9 availability of March actual data and the deadline established for ORS' testimony
10 in this docket. PEC does not object to this slight change of procedure and notes
11 that each succeeding review period will consist of twelve months, beginning each
12 March and concluding each February.

13 **Q. Please summarize key fuel cost and inventory information for the review**
14 **period.**

15 A. Barkley Exhibit No. 1 summarizes PEC's fossil fuel costs for the review period,
16 including quantities purchased and consumed and the beginning and ending
17 inventory levels. The price of delivered coal increased slightly by \$1.32 per ton
18 (1.9%) as compared to the prior review period, up to \$72.67/ton. This reflected
19 relative stability in the coal and freight markets experienced during 2007. The
20 inventory levels maintained by PEC for both coal and oil ensured that an adequate
21 supply of these fuels was available to meet customer needs during the review
22 period at a reasonable cost. The price of natural gas declined during the current
23 review period by \$.25/mmbtu, (2.6%) as the gas market was also stable during the

majority of the period, with minimal hurricane damage impacting market prices since the catastrophic fall of 2005.

Q. Please describe the Company's coal procurement practices.

A. The Company continues to follow the same procurement practices that it has historically followed, and a summary of those practices is as follows:

1. **Estimate Fuel Requirements.** Fuel requirements are estimated using both long-term and short-term simulation models. These simulation models factor in load forecasts, system planning and capacity factors for all generating plants.
2. **Establish Inventory Requirements.** PEC uses a systematic inventory modeling process developed by North Carolina State University to evaluate probabilities and quantify potential risks that could potentially impact inventory levels. The outcome of the model is optimal inventory levels for each plant given potential risks such as losing a coal handling system or a strike by the railroad.
3. **Monitor Ongoing Fuel Requirements.** On a monthly basis, there is a review and evaluation of current inventory levels, supplier performance and forecasted short-term requirements and commitments to determine additional fuel requirements.
4. **Develop Qualified Supplier List.** A list of qualified suppliers is maintained throughout the year and, to the extent possible, capabilities of suppliers are evaluated including current performance, reserves, coal quality, railroad origination, condition of supplier and loading capabilities.

- 1 5. **Bid Requests.** At least once a year, a formal solicitation is sent out to all
2 qualified suppliers for spot and/or longer term coal. PEC seeks staggered
3 expiration terms to reduce the impact of market volatility on customer rates.
- 4 6. **Bid Evaluation.** Contracts are awarded after a thorough evaluation process
5 including an economic evaluation, financial and credit review of the
6 supplier, performance evaluation, coal quality conformance with plant
7 requirements, supplier quality controls, test burns (if necessary) and
8 compliance with federal environmental regulations.
- 9 7. **Spot Purchases.** To supplement our fuel supply, short-term spot offers are
10 solicited as needed and purchases made in accordance with PEC's needs.
11 These purchases may be limited to a single train.
- 12 8. **Monitoring of Purchases.** Purchases are administered, monitored and
13 expedited as needed to ensure compliance with contractual terms.
- 14 9. **Quality Control.** The Company requires suppliers to sample, analyze and
15 weigh all coal shipped under the agreements using independent third party
16 labs and certified scales. Three to four samples are typical with one sample
17 being a referee sample should a dispute arise. Sample analyses are used for
18 contractual quality pricing adjustments. Weighing is done at the mine using
19 certified scales and, if no scales are certified at the mine, certified railroad
20 scales are used.

21 **Q. What types of coal does PEC burn in its plants?**

22 A. PEC's coal-fired units were designed to burn high BTU bituminous coal.
23 Environmental requirements dictate that either the coal is relatively low in sulfur or

1 that sulfur emissions are reduced by pollution control devices. With the exception
2 of Roxboro Unit 4 and Mayo Unit 1, all NC coal-fired plants must emit a sulfur
3 dioxide (SO₂) content no greater than 2.3 lbs. SO₂/mmbtu. Roxboro Unit 4 and
4 Mayo Unit 1 must emit a level no greater than 1.2 lbs. SO₂/mmbtu. The coal to
5 satisfy this requirement, known as compliance coal, has historically comprised
6 about one-third of PEC's annual requirement, or about 4 million tons.

7 **Q. Does the sulfur limitation influence coal procurement?**

8 A. Yes. Environmental regulations require the operator of a coal fired unit to hold an
9 SO₂ emission allowance for every ton of SO₂ emitted during the operation of that
10 unit. SO₂ emission allowances have a market value and thus influence the cost of
11 coal. The lower sulfur coals will emit less SO₂ and will therefore require less
12 emission allowances and are more expensive. The difference per ton between the
13 market prices for compliance and non-compliance coal was approximately \$3 per
14 ton during the review period. The SO₂ limits currently preclude the use of most
15 Northern Appalachia coals or coals from the Illinois Basin at PEC's coal-fired
16 generating units that are not equipped with SO₂ removal devices known as
17 scrubbers. These coals typically have sulfur contents greater than PEC is allowed
18 to emit. Additionally, transportation of these coals is expensive due to the distance
19 from PEC's generating units. Therefore, the majority of PEC's coal sources for its
20 non-scrubbed units will continue to be mid-range sulfur coals predominately
21 located in the Central Appalachia (CAPP) region which includes West Virginia,
22 Virginia and Kentucky.

23 **Q. Please provide an update on PEC's ability to burn higher sulfur coal.**

1 A. PEC has installed scrubbers at its two generating units located near Asheville, NC,
2 and at two of the four units at its Roxboro generating facility. The other two
3 Roxboro units will have scrubbers installed during 2008 and a scrubber installation
4 is planned for the Mayo Unit in the spring of 2009. Upon completion of the
5 installation of the three remaining scrubbers, PEC will have the capability to
6 purchase higher sulfur coal for approximately 75% of its annual requirement.

7 **Q. How will the ability to burn higher sulfur coal impact PEC's future fuel costs?**

8 A. As I will address later in my testimony, the market price of coal can change
9 significantly in a short time period. Therefore, the future relationship between the
10 price of higher sulfur coal and the lower sulfur coals that PEC has traditionally
11 consumed at the locations that will have scrubbers installed cannot be predicted
12 with certainty. As with the procurement of any product, the increased flexibility in
13 coal selection will provide benefits as PEC seeks future supplies.

14 The cost advantage that previously existed on a delivered basis for high sulfur coals
15 from Northern Appalachia and the Illinois Basin has eroded as a result of greater
16 demand for these coals and its associated transportation. At this time, the most
17 economical coal for PEC's units with installed scrubbers is a higher sulfur,
18 approximately 2.5 lbs. SO₂/mmbtu, coal from the CAPP region. This type of coal
19 currently has a price advantage over the non-compliance coal previously consumed
20 at these units of approximately \$5 per ton.

21 **Q. How does the Company make its coal selection decisions?**

22 A. Evaluations of PEC's long-term and short-term coal needs are made from the
23 standpoint of obtaining a reliable supply of coal at the lowest total cost. Items

1 considered include coal price, coal quality, transportation cost, operating costs such
2 as the limestone and ammonia needed to operate pollution control devices,
3 maintenance costs, emission allowance costs and any associated capital costs.
4 PEC uses a wide variety of procurement options through its supplier bidding
5 process in order to obtain the best-priced coal for its generating fleet.

6 **Q. Please describe the current state of the coal market.**

7 A. Barkley Exhibit No. 2 illustrates the movement of coal prices since 2003, most
8 notably the significant increase in price experienced during 2008. During 2008,
9 market prices for non-compliance CAPP coal delivered via the Norfolk & Southern
10 (NS) railway have increased from \$60 per ton to \$103 per ton. These prices are
11 currently at record-high levels. Similar increases have been experienced for all
12 types of coal from the CAPP region. This unprecedented surge in coal prices is
13 driven by many factors. The primary cause is the huge demand for coal-fired
14 electricity in China, India and other developing nations. This growth caused an
15 increase of 30% in worldwide coal consumption from 2001 to 2006. During that
16 period, the growth in China's consumption of electricity exceeded Japan's total
17 current annual consumption.

18 In addition to the ever-increasing worldwide demand for coal-fired electric
19 generation, the price of coal used in steel making has tripled recently to over \$300
20 per ton in response to heavy worldwide demand for steel. There have also been
21 some specific situations which have hastened the rise in prices experienced over the
22 past six months. These situations include a self-imposed moratorium on coal
23 exports by China as extreme winter weather combined with growing demand led to

1 electrical shortages there. Australia, the world's largest coal exporter, experienced
2 severe flooding which hampered mining and is also experiencing shipping delays.
3 South Africa experienced mining problems due to electrical shortages. Russian
4 exports were interrupted by rail car shortages and political disputes. These events
5 have increased the demand for South American and US coal in the European
6 market. The devaluation of the US dollar has also made US coal attractive in
7 Europe. Finally, the fact that coal, even at these elevated prices, is still much less
8 expensive than natural gas or oil alternatives has further supported an increase in
9 US coal exports.

10 The addition of new domestic coal supplies cannot keep pace with the factors
11 causing these price increases. Factors impeding the addition of new coal supplies
12 include increasing mining costs, a shortage of labor resources, safety and
13 environmental regulations and difficult permitting requirements for new mines.

14 **Q. Are coal prices expected to remain at these high levels?**

15 A. As shown on my Exhibit No. 2, the market is expected to decline some by the end
16 of 2009, but such price declines are expected to be modest based on the
17 combination of increasing demand for coal both domestically and internationally,
18 barriers to increased supply and the significant price advantage that coal has when
19 compared to competing fuels. Even if coal prices retreat somewhat, PEC must
20 contract for coal now to replace contracts that are expiring. In addition, given the
21 high demand for coal, PEC has prudently continued to execute coal contracts rather
22 than delaying in order to observe future market price developments. These

1 contracts were executed in order to secure adequate supplies to meet the needs of
2 our customers.

3 **Q. What impact does this have on the projected cost of coal for the forecasted**
4 **period?**

5 A. PEC projects that its delivered cost of coal for the forecasted period will be \$90 per
6 ton, as compared to approximately \$73 per ton for the test period. This increase is
7 caused by the expiration of contracts in effect during the period ending February
8 29, 2008 and replacement with coal that will be obtained at significantly higher
9 prices. PEC has entered contracts for over 95% of its coal requirements for the
10 remainder of 2008 and 2009. These contracts will enhance the reliability of coal
11 supply over the forecasted period.

12 **Q. What will PEC do to reduce coal costs in light of this significant increase in**
13 **market prices?**

14 A. Receipt of coal under contract at prices that are lower than current market prices
15 will be very important. In accordance with procedures outlined previously in my
16 testimony, PEC will carefully monitor those receipts to ensure compliance with the
17 established contracts. PEC is continuing to migrate to higher sulfur coals which
18 will provide supply flexibility and potentially cost savings. PEC will also continue
19 to adhere to its disciplined strategy of procuring most of its coal under contractual
20 arrangements of varying lengths and vintages, supplementing with market
21 purchases as appropriate.

22 **Q. How is coal transported to PEC?**

1 A. Coal is generally transported to individual plants by rail using either the CSX
2 railway or the NS railway. PEC receives a limited amount of coal by truck at
3 Asheville and has received foreign coal by barge at the Sutton Plant located near
4 Wilmington, NC. The Roxboro and Mayo plants, PEC's largest coal plants, and
5 the Asheville plant are served solely by NS. The Robinson, Weatherspoon, and
6 Sutton Plants are served solely by CSX. The Lee and Cape Fear Plants are served
7 by both CSX and NS. To minimize transportation costs, PEC attempts to negotiate
8 the most advantageous rates possible. PEC, through a consortium of shippers,
9 participates in proceedings before the Federal Surface Transportation Board in an
10 attempt to lower its rail costs. PEC's use of water and truck transportation
11 demonstrates its commitment to diversification of coal transportation.

12 **Q. What changes are expected for transportation costs during the forecasted**
13 **period?**

14 A. PEC projects an increase in freight costs from approximately \$20 per ton
15 experienced during the review period to approximately \$25 per ton in the forecast
16 period. The increase is based on a contract renewal, inflation adjustments in
17 existing contracts and fuel surcharges. Railroads are able to pass along increases in
18 their fuel costs based upon the price of crude oil which currently stands at a
19 historically high rate of approximately \$120 per barrel.

20 **Q. Please describe your procurement practices for natural gas.**

21 A. PEC follows a process that is very similar to that discussed earlier for coal.
22 Production costing models are used to project future demands. Based on the
23 projections, solicitations are made, bids received, and contracts are established to

1 cover a minimum of 75% of our projected needs for the coming year and 60% of
2 firm needs for a period of up to five years. Long term contracts are established and
3 maintained for gas transportation. Commodity contracts are currently established
4 on terms of up to five years. Typically, commodity contracts are established on the
5 basis of recognized industry price indices with appropriate adders. On a short term
6 basis, additional purchases on the spot market are made as needed.

7 **Q. Please describe the state of the natural gas market and PEC's expectations for**
8 **the forecasted period?**

9 A. The natural gas market is shown on Barkley Exhibit No. 3. In general, the market
10 remained relatively calm following the extremely high prices that occurred in 2005
11 following Hurricanes Katrina and Rita. However, prices have recently reached
12 extremely high levels in response to crude oil prices which have set records
13 recently at approximately \$120 per barrel, strong demand for natural gas worldwide
14 and decreased levels of domestic storage as compared to historical highs
15 experienced in 2007. Strong global demand for liquefied natural gas (LNG) has
16 caused lower than expected amounts to flow into the US. Strong economic growth
17 in developing nations, cold weather in Europe and nuclear outages in Japan have
18 contributed to the worldwide demand for LNG. PEC expects continued volatility
19 in the natural gas markets. PEC's forecasted delivered cost, excluding fixed costs,
20 for the year ending June 30, 2009 is \$9.82/mmbtu. This includes the benefit of
21 natural gas price hedges. The current market price approximates \$11/mmbtu,
22 excluding fixed costs.

23 **Q Please discuss any hedging practices that PEC employs for coal or natural gas.**

1 A. The most significant hedging practice that PEC employs is the fuel diversity of its
2 generation resources as discussed by PEC Witness Roberts. PEC has traditionally
3 hedged its coal costs by entering into long term contracts at fixed prices for a
4 significant portion of its projected coal needs. Any additional coal requirement is
5 purchased on the spot market as needed to maintain inventories. PEC strives to
6 stagger coal contract expiration dates so that a portion of the contracts expire each
7 year and is replaced with new contracts of similar duration. PEC currently expects
8 to procure a minimum of 85% of its projected needs for the current year under
9 contract. The annual amount under contract decreases to 60% or more for year 2
10 with minimums of 40%, 20% and 5% for years 3-5. Contracts beyond five years
11 may be pursued if appropriate terms and conditions can be established. PEC
12 believes that this structure of tiered contracts provides a reasonable degree of cost
13 stability and allows the Company to respond appropriately to market trends, either
14 upward or downward.

15 In response to increased usage, PEC began hedging its natural gas requirements in
16 2005 by executing fixed price contracts. Most of PEC's hedges for the review and
17 forecasted periods utilize financial fixed price contracts to reduce price volatility
18 and provide improved rate stability for customers. PEC's target for natural gas
19 price assurance is a range of 50% to 80% of estimated consumption for the current
20 year. Ranges decrease progressively in succeeding years.

21 **Q. Please discuss the methodology that you use to prepare forecasts of future coal**
22 **and gas prices.**

1 A. The primary coal price forecast is developed based upon a third party forecast
2 prepared by Ventyx, an energy services company that specializes in energy related
3 forecasting and modeling support. This forecast is developed using econometric
4 principles and evaluation of market specific supply and demand factors. PEC
5 believes that these forecasts reasonably represent coal market trends. The current
6 forecast for natural gas prices is based on the NYMEX Forward Price Curve. Other
7 costs, such as interstate pipeline charges and local distribution company charges are
8 applied to arrive at a specific price for each generating plant.

9 **Q. Does PEC purchase power and how are costs recorded?**

10 A. Yes. As explained by PEC witness Roberts, PEC continually evaluates purchasing
11 power if it can be reliably procured and delivered at a price that is less than the
12 variable cost of PEC's generation. In accordance with S.C. Code Ann. § 58-27-
13 865(A), PEC includes the lower of the purchase price or PEC's avoided variable
14 cost for generating an equivalent amount of power for its economy purchases.
15 Additionally, PEC purchases power from certain vendors that is treated as a firm
16 generation capacity purchase. In accordance with the statute, all of these costs are
17 recorded as recoverable fuel costs with the exception of capacity charges.

18 **Q. Please explain Barkley Exhibit No. 4**

19 A. Barkley Exhibit No. 4 is a summary of PEC's actual system fuel cost and kilowatt-
20 hour sales experienced during the period April 2007 through February 2008. Total
21 system fuel costs were \$1,251,945,253 and the total sales were 50,660,744,570
22 kilowatt-hours (kWh) for an annual average of 2.471 cents per kWh.

1 **Q. How did the fuel revenue billings compare to the actual fuel costs incurred**
2 **during the historical period April 2007 through February 2008?**

3 A. Barkley Exhibit No. 5 is a monthly comparison of fuel revenues billed to South
4 Carolina retail customers to the actual fuel costs attributable to those sales. During
5 the review period, PEC's under-recovery of fuel costs decreased from \$22.9 million
6 to \$14.5 million.

7 **Q. Please explain Barkley Exhibit No. 6.**

8 A. Barkley Exhibit No. 6 presents a fuel rate of 3.151 ¢/kWh for the 12-month period
9 July 2008 through June 2009, consisting of a component for recovery of projected
10 fuel expense for this period of 2.991¢/kWh and a component to collect the
11 projected under-recovery at June 30, 2008 of .160¢/kWh. The projected under-
12 recovery at June 30, 2008 is \$11.1 million.

13 The fuel forecast supporting the projected fuel cost was generated by an hourly
14 dispatch model that considers the latest forecasted fuel prices, outages at the
15 generating plants based on planned maintenance and refueling schedules, forced
16 outages based on historical trends, generating unit performance parameters and
17 expected market conditions associated with power purchase and off-system sales
18 opportunities.

19 **Q. Please explain Barkley Exhibit No. 7.**

20 A. Barkley Exhibit No. 7 provides projected costs and revenues, by month, for the
21 period March 2008 through June 2009. The exhibit continues the use of the current
22 base fuel component of 2.651¢/kWh through June 2008 and shows a fuel factor of
23 3.151 ¢/kWh for the period July 2008 through June 2009.

1 **Q. Please provide a status update of environmental cost collection and explain**
2 **how these costs have been treated in this filing.**

3 A. Legislation was effective on May 3, 2007, that enabled the collection of ammonia,
4 lime, limestone, urea, dibasic acid, catalysts and emission allowance costs through
5 an environmental cost rider. Only sulfur dioxide emission allowance costs had
6 previously been recoverable through the fuel clause. PEC did not include the
7 collection of any other environmental costs in its 2007 filing because the filing
8 preceded the effective date of the legislation. Therefore, the environmental costs of
9 \$17,964,189 detailed on Barkley Exhibit No. 8 resulted in a net undercollection of
10 \$1,184,913 at February 29, 2008 as shown on Barkley Exhibit No. 9.

11 **Q. How did PEC allocate environmental costs?**

12 A. Costs are allocated consistently with the Commission's Order in PEC's 2007 fuel
13 review proceeding, Docket No. 2007-1-E. Costs were allocated to Residential,
14 General Service (non-demand), General Service (demand) and Lighting based upon
15 the coincident peak experienced during the review period. This allocation is shown
16 on Barkley Exhibit No. 10. Rates were designed based on costs allocated to the
17 respective classes and the projected energy consumption for the residential, general
18 service (non-demand) and lighting schedules. The rate for general service
19 (demand) class was based on projected annual demand in a manner consistent with
20 the methodology approved in 2007.

21 **Q. Were any changes made in the classification of customers?**

22 A. Yes, two small refinements were made in PEC's proposed rates shown on Exhibit
23 No. 10. The first is to include sales under the Sports Field Lighting Schedule

1 (SFLS) in the Lighting Customer Class and secondly, to include sales under the
2 Traffic Signal Service Schedule (TSS) in the General Service (non-demand)
3 customer class. Sales under Schedule SFLS occur primarily at night, similar to
4 sales under the Company's outdoor lighting schedules; therefore the usage
5 characteristic more closely matches the Lighting Class rather than the General
6 Service (non-demand) class that was used in the last proceeding. Similarly, sales
7 under Schedule TSS occur during all hours of the day, more consistent with sales
8 under general service (non-demand) schedules, rather than the Lighting Class that
9 was used in the last proceeding. No other changes are proposed to the customer
10 classes set forth in Adjustment for Fuel and Variable Environmental Costs Rider
11 39.

12 **Q. Have you provided a forecast of environmental costs?**

13 A. Yes. Barkley Exhibit No. 11 provides PEC's estimate of environmental costs for
14 the period from March 2008 through June 2009. The forecasted environmental
15 expenses for the year ending June 30, 2009 are \$28,671,451. This represents an
16 approximately 60% increase over the eleven-month review period. The primary
17 reason for the increase is PEC's increased limestone consumption due to additional
18 scrubbers coming on line at the Roxboro and Mayo generating units.

19 **Q. Were PEC's fuel and environmental costs prudently incurred during the**
20 **review period?**

21 A. Yes. PEC's fuel and environmental costs were prudently incurred and accurately
22 recorded and are fully recoverable pursuant to the South Carolina law. As
23 discussed by PEC witness Roberts, PEC prudently operated its generation resources

1 during the period under review in order to minimize its fuel costs and purchased
2 power when doing so was cost effective.

3 **Q. Does that complete your testimony?**

4 **A. Yes, it does.**

**FUEL CONSUMED, PURCHASED AND INVENTORIED
FOR THE ELEVEN MONTHS ENDED FEBRUARY 29, 2008**

| <u>COAL</u> | <u>Tons</u> | <u>\$/Ton</u> |
|-------------------|-------------|---------------|
| Consumed | 11,973,391 | \$72.42 |
| Coal Purchased | 11,275,554 | \$52.58 |
| Freight Purchased | 11,275,554 | \$20.09 |
| Total Purchased | 11,275,554 | \$72.67 |
| \$/mmbtu consumed | \$2.93 | |

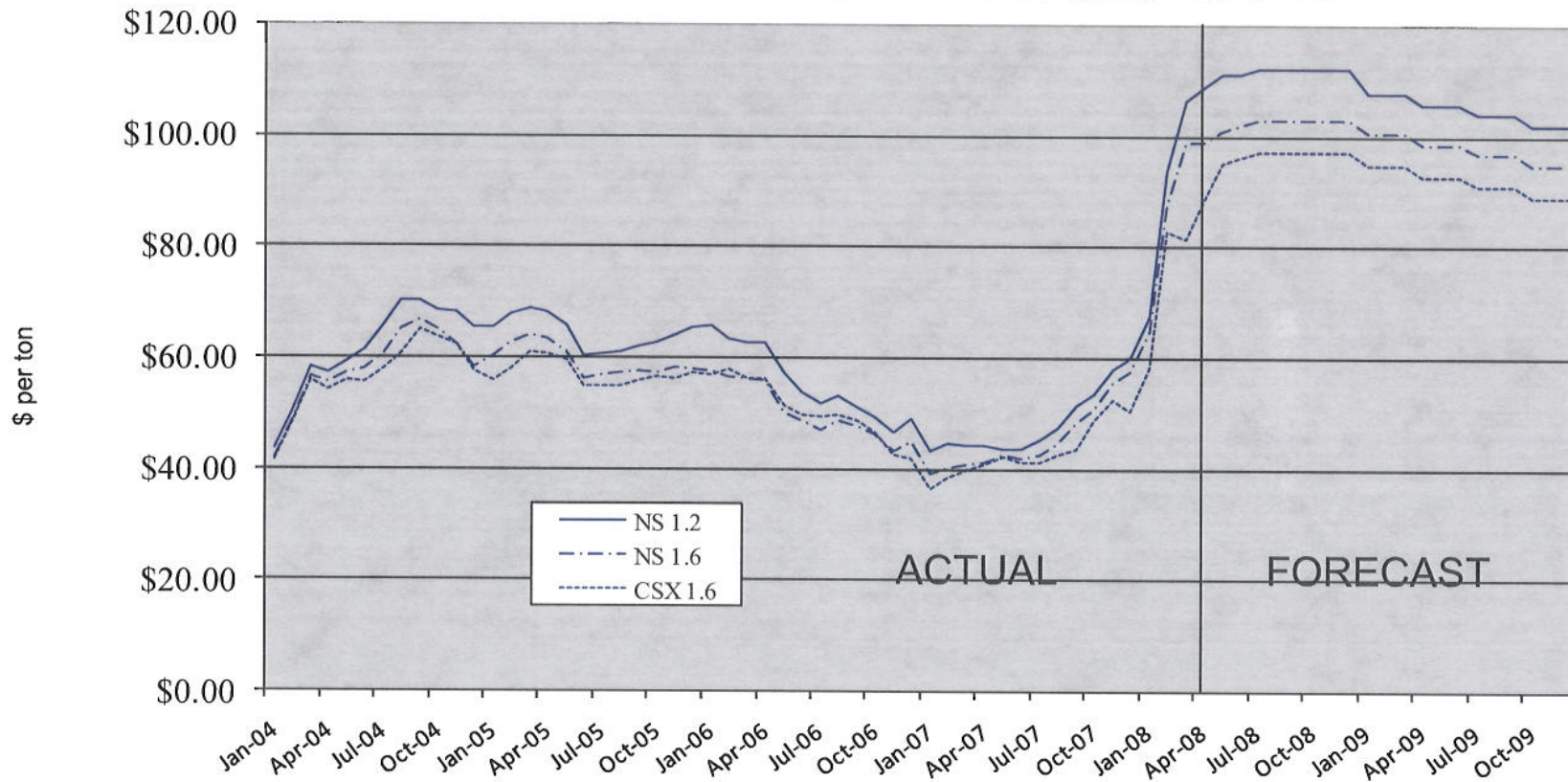
| <u>OIL</u> | <u>Gallons</u> | <u>\$/Gallon</u> |
|-------------------|----------------|------------------|
| Consumed | 15,352,627 | \$1.76 |
| Purchased | 15,477,925 | \$2.37 |
| \$/mmbtu consumed | \$12.64 | |

| <u>NATURAL GAS</u> | <u>mmbtu</u> | <u>\$/mmbtu</u> |
|--------------------|--------------|-----------------|
| Consumed | 25,192,896 | \$9.51 |
| Purchased | 25,253,578 | \$9.50 |

INVENTORIES AS OF FEBRUARY 28/29

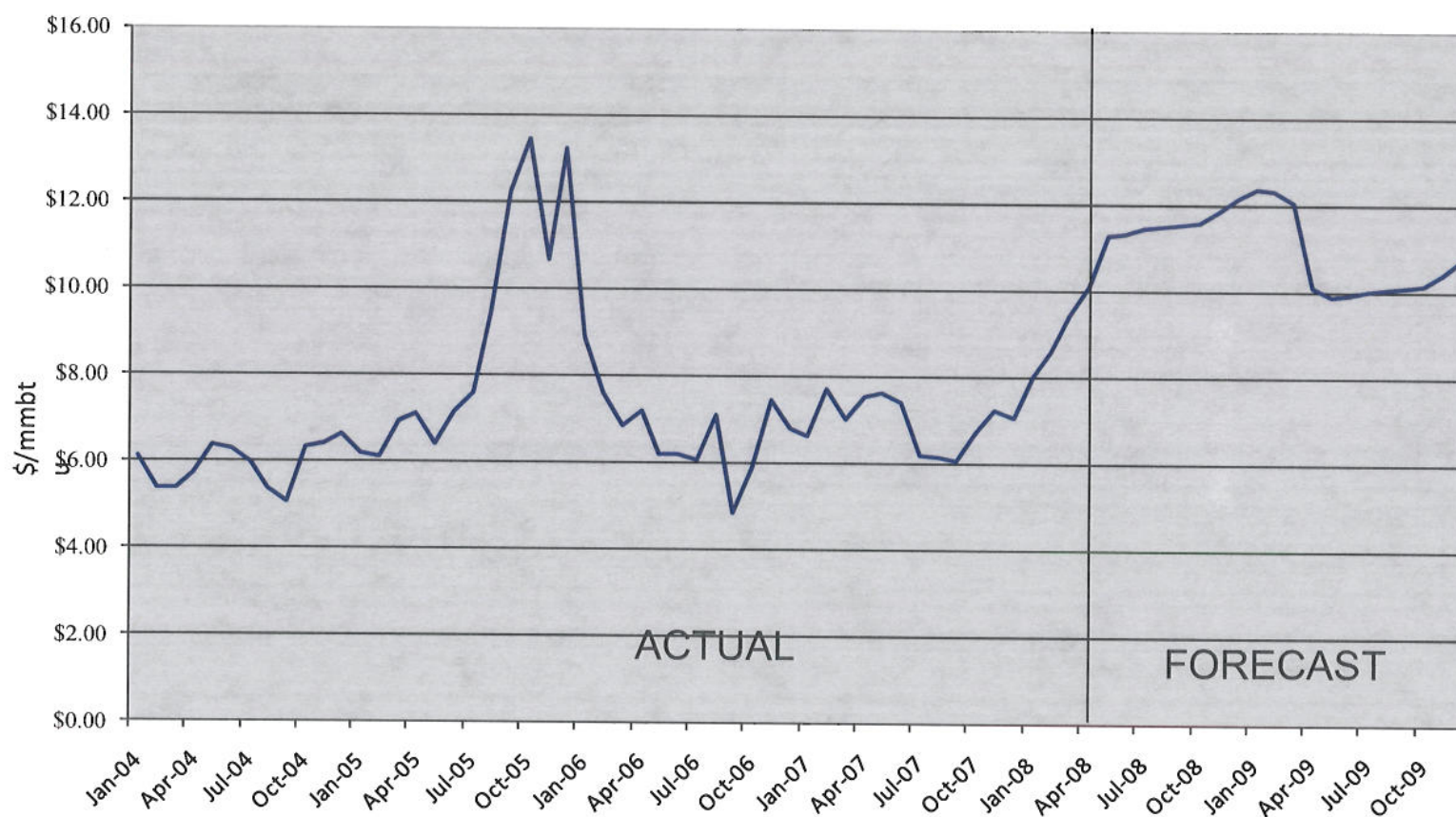
| | <u>2007</u> <u>Units</u> | <u>2007</u> <u>\$/Unit</u> | <u>2008</u> <u>Units</u> | <u>2008</u> <u>\$/Unit</u> |
|---------------------|-----------------------------|-------------------------------|-----------------------------|-------------------------------|
| Coal (tons) | 2,375,342 | \$72.76 | 1,629,562 | \$73.92 |
| Oil (gallons) | 31,378,103 | \$1.43 | 31,201,687 | \$1.74 |
| Natural Gas (mmbtu) | 80,577 | \$8.07 | 141,259 | \$8.46 |

COAL PRICE TRENDS



Barkley Exhibit No. 2
Docket 2008-1-E

NATURAL GAS PRICE TRENDS



Actual – NYMEX Last Day Settle Prices

Forecast – NYMEX Settle Prices as of 03/31/2008

Henry Hub Prices



PROGRESS ENERGY CAROLINAS, INC.

SYSTEM FUEL COST

SOUTH CAROLINA RETAIL FUEL CASE - Docket No. 2008-1-E
ELEVEN MONTHS ENDED FEBRUARY 2008

| Line | | Apr-07 | May-07 | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 | Nov-07 | Dec-07 | Jan-08 | Feb-08 | Eleven Months Ended Feb-08 |
|------|---------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|------------------------|-------------------------------|
| (1) | Coal | \$70,421,353.04 | \$73,118,674.95 | \$78,124,486.36 | \$83,000,802.26 | \$95,101,879.37 | \$80,608,056.37 | \$77,212,395.56 | \$70,235,043.69 | \$81,341,751.57 | \$84,640,584.08 | \$73,357,628.57 | 867,162,655.82 |
| (2) | Oil - Steam | 631,988.09 | 657,230.82 | 674,248.18 | 497,107.41 | 377,392.54 | 700,484.05 | 992,497.67 | 594,231.47 | 1,035,977.14 | 583,237.21 | 884,942.88 | 7,629,337.46 |
| (3) | Oil - Turbine | 1,004,603.66 | 140,130.10 | 422,306.02 | 139,677.46 | 7,090,565.40 | 2,799,175.12 | 1,414,367.43 | 61,569.63 | 1,163,963.68 | 3,573,065.11 | 1,528,672.24 | 19,338,095.85 |
| (4) | Gas - Steam | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| (5) | Gas - Turbine | 24,932,367.33 | 14,162,677.71 | 25,208,469.51 | 29,520,830.18 | 53,057,667.27 | 28,647,315.36 | 19,172,445.58 | 4,915,324.37 | 9,508,383.04 | 21,686,352.72 | 8,672,920.53 | 239,484,753.60 |
| (6) | Total Fossil | 96,990,312.12 | 88,078,713.58 | 104,429,510.07 | 113,158,417.31 | 155,627,504.58 | 112,755,030.90 | 98,791,706.24 | 75,806,169.16 | 93,050,075.43 | 110,483,239.12 | 84,444,164.22 | 1,133,614,842.73 |
| (7) | Emission Allowance | 1,616,597.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,616,597.60 |
| (8) | Nuclear Fuel | 6,383,497.28 | 9,500,122.98 | 10,314,742.91 | 10,623,396.97 | 10,607,740.25 | 8,875,446.36 | 8,185,443.75 | 9,997,600.89 | 10,300,543.93 | 10,335,305.47 | 9,652,186.37 | 104,776,027.16 |
| (9) | Purchased Power | 16,070,475.42 | 8,853,395.20 | 16,783,907.45 | 19,961,559.25 | 28,298,187.79 | 14,724,771.69 | 15,730,337.73 | 6,257,534.26 | 8,236,824.00 | 13,501,975.34 | 7,940,022.94 | 156,358,991.07 |
| (10) | Off-System Sales | (5,357,514.41) | (8,271,631.93) | (9,848,180.49) | (13,032,039.25) | (18,073,422.13) | (13,049,125.45) | (11,616,160.39) | (16,796,449.93) | (18,899,347.34) | (12,732,364.68) | (16,744,969.96) | (144,421,205.96) |
| (11) | Total Fuel Costs | \$115,703,368.01 | \$98,160,599.83 | \$121,679,979.94 | \$130,711,334.28 | \$176,460,010.49 | \$123,306,123.50 | \$111,091,327.33 | \$75,264,854.38 | \$92,688,096.02 | \$121,588,155.25 | \$85,291,403.57 | \$1,251,945,252.60 |
| (12) | Total kWh Sales | 3,983,721,892 | 4,043,264,587 | 4,583,819,600 | 5,087,064,095 | 5,336,046,729 | 5,117,025,632 | 4,459,769,232 | 4,110,781,089 | 4,326,242,337 | 4,814,371,283 | 4,798,638,094 | 50,660,744,570 |
| (13) | Cost per kWh | \$0.02904 | \$0.02428 | \$0.02655 | \$0.02569 | \$0.03307 | \$0.02410 | \$0.02491 | \$0.01831 | \$0.02142 | \$0.02526 | \$0.01777 | \$0.02471 |

PROGRESS ENERGY CAROLINAS, INC.

Comparison of Actual Fuel Revenues and Expenses
SOUTH CAROLINA RETAIL FUEL CASE - Docket No. 2008-1-E
ELEVEN MONTHS ENDED FEBRUARY 2008

| Line | | Apr-07 | May-07 | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 | Nov-07 | Dec-07 | Jan-08 | Feb-08 | Eleven Months Ended Feb-08 |
|------|--------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|
| (1) | Actual SC Retail Sales [KWH] | 505,805,309 | 520,976,074 | 567,855,940 | 621,888,449 | 651,026,022 | 634,995,809 | 562,477,417 | 512,741,056 | 513,703,214 | 592,113,342 | 608,422,958 | 6,292,005,590 |
| (2) | Actual Fuel Cost [\$ / KWH] | 0.02904 | 0.02428 | 0.02655 | 0.02569 | 0.03307 | 0.02410 | 0.02491 | 0.01831 | 0.02142 | 0.02526 | 0.01777 | |
| (3) | Fuel Base [\$ / KWH] | 0.02500 | 0.02500 | 0.02500 | 0.02651 | 0.02651 | 0.02651 | 0.02651 | 0.02651 | 0.02651 | 0.02651 | 0.02651 | |
| (4) | Revenue Required [\$] | 14,688,586 | 12,649,299 | 15,076,575 | 15,976,314 | 21,529,431 | 15,303,399 | 14,011,312 | 9,388,289 | 11,003,523 | 14,956,783 | 10,811,676 | 155,395,187 |
| (5) | Revenue Billed [\$] | 12,645,133 | 13,024,402 | 14,196,399 | 16,486,263 | 17,258,700 | 16,833,739 | 14,911,276 | 13,592,765 | 13,618,272 | 15,696,925 | 16,129,293 | 164,393,167 |
| (6) | Over (Under) Recovery [\$] | (2,043,453) | 375,103 | (880,176) | 509,949 | (4,270,731) | 1,530,340 | 899,964 | 4,204,476 | 2,614,749 | 740,142 | 5,317,617 | 8,997,980 |
| (7) | Accounting Adjustments [\$] | 41,263 | | 51,069 | | | (317,564) | | | | | | (225,232) |
| (8) | Interest [\$] | (76,782) | (71,493) | (61,132) | (51,683) | (37,056) | (21,559) | (8,517) | (207) | 0 | 0 | 0 | (328,429) |
| (9) | Cumulative Under Recovery [\$] | (25,005,441) | (24,701,831) | (25,592,070) | (25,133,804) | (29,441,591) | (28,250,374) | (27,358,927) | (23,154,658) | (20,539,909) | (19,799,767) | (14,482,150) | |

**Barkley Exhibit No. 5
Docket 2008-1-E**

PROGRESS ENERGY CAROLINAS, INC.

SOUTH CAROLINA RETAIL FUEL CASE - DOCKET 2008-1-E
CALCULATION OF BASE FUEL COMPONENT
For the Year Ending June 30, 2009

1. Projected Fuel Expense from July 2008 through June 2009

| | |
|----------------------|------------------|
| Cost of Fuel | \$1,679,812,754 |
| System Sales | 56,166,729 Mwhts |
| Average Cost Per KWH | 2.991 cents |

2. Revenue Difference To be Collected from July 2008 through June 2009

| | |
|---------------------------------|-----------------|
| Under-Recovery at June 30, 2008 | \$11,131,394 |
| Projected S.C. Retail Sales | 6,943,887 Mwhts |
| Average Cost Per KWH | 0.160 cents |

3. Base Fuel Cost Per KWH - Projected Period

| | |
|---------------------|--------------------|
| Average Fuel Cost | 2.991 cents |
| Revenue Difference | <u>0.160</u> cents |
| Base Fuel Component | 3.151 cents |

PROGRESS ENERGY CAROLINAS, INC.

Comparison of Estimated Fuel Revenues and Expenses
SOUTH CAROLINA RETAIL FUEL CASE - Docket No. 2008-1-E

| Line | Mar-08 | Apr-08 | May-08 | Jun-08 | Jul-08 | Aug-08 | Sep-08 | Oct-08 |
|--------------------------------------|----------------|----------------|---------------|----------------|----------------|----------------|---------------|---------------|
| (1) Estimated SC Retail Sales (kWh) | 487,861,612 | 516,752,321 | 527,648,657 | 598,332,062 | 646,724,068 | 682,825,284 | 620,924,543 | 547,851,960 |
| (2) Estimated Fuel Cost [\$ /KWH] | 0.02240 | 0.02258 | 0.02435 | 0.02956 | 0.03586 | 0.03164 | 0.02493 | 0.02837 |
| (3) Fuel Base [\$ /KWH] | 0.02651 | 0.02651 | 0.02651 | 0.02651 | 0.03151 | 0.03151 | 0.03151 | 0.03151 |
| (4) Revenue Required | \$10,928,100 | \$11,668,267 | \$12,848,245 | \$17,686,696 | \$23,191,525 | \$21,604,592 | \$15,479,649 | \$15,542,560 |
| (5) Revenue Billed | \$12,933,211 | \$13,699,104 | \$13,987,966 | \$15,861,783 | \$20,378,275 | \$21,515,825 | \$19,565,332 | \$17,262,815 |
| (6) Over (Under) Recovery | \$2,005,111 | \$2,030,837 | \$1,139,721 | (\$1,824,913) | (\$2,813,250) | (\$88,767) | \$4,085,683 | \$1,720,255 |
| (7) Cumulative Over (Under)-Recovery | (\$12,477,039) | (\$10,446,202) | (\$9,306,481) | (\$11,131,394) | (\$13,944,644) | (\$14,033,411) | (\$9,947,728) | (\$8,227,473) |

| Line | Nov-08 | Dec-08 | Jan-09 | Feb-09 | Mar-09 | Apr-09 | May-09 | Jun-09 |
|--------------------------------------|---------------|---------------|---------------|--------------|--------------|--------------|--------------|---------------|
| (1) Estimated SC Retail Sales (kWh) | 499,722,252 | 556,768,021 | 636,460,983 | 562,026,592 | 535,652,020 | 520,573,811 | 531,415,152 | 602,942,012 |
| (2) Estimated Fuel Cost [\$ /KWH] | 0.02810 | 0.02770 | 0.02808 | 0.02661 | 0.03175 | 0.02962 | 0.03174 | 0.03354 |
| (3) Fuel Base [\$ /KWH] | 0.03151 | 0.03151 | 0.03151 | 0.03151 | 0.03151 | 0.03151 | 0.03151 | 0.03151 |
| (4) Revenue Required | \$14,042,195 | \$15,422,474 | \$17,871,824 | \$14,955,528 | \$17,006,952 | \$15,419,396 | \$16,867,117 | \$20,222,675 |
| (5) Revenue Billed | \$15,746,248 | \$17,543,760 | \$20,054,886 | \$17,709,458 | \$16,878,395 | \$16,403,281 | \$16,744,891 | \$18,998,703 |
| (6) Over (Under) Recovery | \$1,704,053 | \$2,121,286 | \$2,183,062 | \$2,753,930 | (\$128,557) | \$983,885 | (\$122,226) | (\$1,223,972) |
| (7) Cumulative Over (Under)-Recovery | (\$6,523,420) | (\$4,402,134) | (\$2,219,072) | \$534,858 | \$406,301 | \$1,390,186 | \$1,267,960 | \$43,988 |

PROGRESS ENERGY CAROLINAS, INC.

SYSTEM ENVIRONMENTAL COST

SOUTH CAROLINA RETAIL FUEL CASE - Docket No. 2008-1-E
ELEVEN MONTHS ENDED FEBRUARY 2008

| Line | Apr-07 | May-07 | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 | Nov-07 | Dec-07 | Jan-08 | Feb-08 | Elevene Months Ended Feb-08 |
|---|--------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------------|
| (1) Emission Allowances (net proceeds) | \$0.00 | \$301,440.48 | \$1,595,358.47 | \$1,888,557.76 | \$2,000,366.07 | \$1,730,951.05 | \$1,399,535.73 | \$872,522.85 | \$1,304,409.57 | \$1,783,253.92 | \$1,588,786.92 | \$14,465,184.82 |
| (2) Ammonia | 0.00 | 695,263.77 | 665,228.76 | 951,608.90 | 1,012,256.77 | 719,311.89 | 808,575.24 | 301,161.73 | 705,981.79 | 807,761.99 | 735,765.38 | 7,402,916.22 |
| (3) Limestone | 0.00 | 43,117.51 | 318,218.62 | 166,057.28 | 237,775.41 | 197,570.87 | 222,384.86 | 264,241.05 | 315,060.40 | 398,885.25 | 367,100.14 | 2,530,411.39 |
| (4) Total Environmental Costs | 0.00 | 1,039,821.76 | 2,578,805.85 | 3,006,223.94 | 3,250,398.25 | 2,647,833.81 | 2,430,495.83 | 1,437,925.63 | 2,325,451.76 | 2,989,901.16 | 2,691,652.44 | 24,398,512.43 |
| (5) Total Environmental Sales | 0.00 | (322,371.26) | (262,231.69) | (304,994.96) | (428,513.38) | (206,479.68) | (501,107.06) | (1,406,697.06) | (1,477,218.73) | (618,847.18) | (905,862.50) | (6,434,323.50) |
| (6) Total Environmental Expense | 0.00 | \$717,450.50 | \$2,316,574.16 | \$2,701,228.98 | \$2,821,884.87 | \$2,441,356.13 | \$1,929,388.77 | \$31,228.57 | \$848,233.03 | \$2,371,053.98 | \$1,785,789.94 | \$17,964,188.93 |
| (7) SC Retail Sales | | 520,976,074 | 567,855,940 | 621,888,449 | 651,026,022 | 634,995,809 | 562,477,417 | 512,741,056 | 513,703,214 | 592,113,342 | 608,422,958 | 5,786,200,281 |
| (8) Total System Sales (Exclude Power Agency) | | 4,043,264,587 | 4,583,819,600 | 5,087,064,095 | 5,336,046,729 | 5,117,025,632 | 4,459,769,232 | 4,110,781,089 | 4,326,242,337 | 4,814,371,283 | 4,798,638,094 | 46,677,022,678 |
| (9) SC Allocation Factor | | 0.1289 | 0.1239 | 0.1222 | 0.1220 | 0.1241 | 0.1261 | 0.1247 | 0.1187 | 0.1230 | 0.1268 | |
| (10) SC Share of Total Environmental Costs | | \$92,479.37 | \$287,023.54 | \$330,090.18 | \$344,269.95 | \$302,972.30 | \$243,295.92 | \$3,894.20 | \$100,685.26 | \$291,639.64 | \$226,438.16 | \$2,222,788.53 |
| (11) SC Share of Total Costs Adjustments | | | | \$15,230.11 | | \$16,874.75 | | | | | | \$32,104.86 |

**Barkley Exhibit No. 8
Docket No. 2008-1-E**

PROGRESS ENERGY CAROLINAS, INC.

Comparison of Actual Environmental Fuel Revenues and Expenses
SOUTH CAROLINA RETAIL FUEL CASE - Docket No. 2008-1-E
ELEVEN MONTHS ENDED FEBRUARY 2008

| Line | Apr-07 | May-07 | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 | Nov-07 | Dec-07 | Jan-08 | Feb-08 | Eleven Months Ended Feb-08 |
|--|--------|------------|--------------|--------------|--------------|--------------|--------------|-----------|------------|--------------|--------------|-------------------------------|
| (1) Total Environmental Expense [\$] | | 717,450.50 | 2,316,574.16 | 2,701,228.98 | 2,821,884.87 | 2,441,356.13 | 1,929,388.77 | 31,228.57 | 848,233.03 | 2,371,053.98 | 1,785,789.94 | 17,964,188.93 |
| (2) SC Allocation Factor of Total Expense | | 0.1289 | 0.1239 | 0.1222 | 0.1220 | 0.1241 | 0.1261 | 0.1247 | 0.1187 | 0.1230 | 0.1268 | |
| (3) SC Share of Total Environmental Expense [\$] | 0.00 | 92,479.37 | 287,023.54 | 330,090.18 | 344,269.95 | 302,972.30 | 243,295.92 | 3,894.20 | 100,685.26 | 291,639.64 | 226,438.16 | 2,222,788.52 |
| (4) Amount Billed to SC Customers [\$] | 0 | 0 | 0 | 131,157 | 139,582 | 135,496 | 114,939 | 106,211 | 113,360 | 132,386 | 132,641 | 1,005,770 |
| (5) Over (Under) Recovery [\$] | 0 | (92,479) | (287,024) | (198,933) | (204,688) | (167,477) | (128,357) | 102,317 | 12,674 | (159,254) | (93,798) | (1,217,018) |
| (6) Accounting Adjustments [\$] | | | | 15,230 | | 16,875 | | | | | | 32,105 |
| (7) Cumulative Under Recovery [\$] | 0 | (92,479) | (379,503) | (563,206) | (767,894) | (918,496) | (1,046,853) | (944,537) | (931,862) | (1,091,116) | (1,184,913) | |

PROGRESS ENERGY CAROLINAS, INC.

SOUTH CAROLINA RETAIL FUEL CASE - DOCKET 2008-1-E
CALCULATION OF ENVIRONMENTAL FUEL COMPONENT
For the Year Ending June 30, 2009

| Line | Class | Allocation Factor | Share of Projected Costs | Share of Under-Recovery at June 30, 2008 | Projected July 08 to June 09 SC Retail Sales (kWh) | Projected Demand Billing units (kW) | Projected Average Environmental Fuel Cost | Under-Recovered Average Environmental Fuel Cost | Total Environmental Fuel Cost Component |
|------|------------------------------|-------------------|--------------------------|--|--|-------------------------------------|---|---|---|
| (1) | Residential | 45.15% | \$1,600,410 | \$875,942 | 2,159,817,225 | | 0.00074 | \$0.00041 | \$0.00115 |
| (2) | General Service (non demand) | 7.58% | \$268,685 | \$147,057 | 332,399,362 | - | 0.00081 | \$0.00044 | \$0.00125 |
| (3) | General Service (demand) | 47.27% | \$1,675,557 | \$917,072 | 4,362,589,958 | 9,864,752 | 0.16985 [1] | \$0.09296 [1] | \$0.26282 |
| (4) | Lighting | 0.00% | \$0 | \$0 | 89,080,153 | | 0.00000 | \$0.00000 | \$0.00000 |
| (5) | Total | 100.00% | 3,544,651 | \$1,940,071 | 6,943,886,698 | 9,864,752 | | | |

SC Environmental Cost Allocation

| | | |
|------|--|----------------|
| (6) | Projected SC Retail Sales from July 08 to June 09 | 6,943,886,698 |
| (7) | Projected Total System Sales from July 08 to June 09 | 56,166,728,995 |
| (8) | Allocation percentage to SC | 0.12363 |
| (9) | Projected Environmental Costs July 08 to June 09 | 28,671,451 |
| (10) | SC Allocation of Projected Costs | 3,544,651 |

[1] Rate is based on the Demand Billing Units

PROGRESS ENERGY CAROLINAS, INC.

Comparison of Estimated Environmental Fuel Revenues and Expenses
SOUTH CAROLINA RETAIL FUEL CASE - Docket No. 2008-1-E

| Line | | Mar-08 | Apr-08 | May-08 | Jun-08 | Jul-08 | Aug-08 | Sep-08 | Oct-08 |
|------|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| (1) | Estimated SO2 Expense [\$] | 1,462,252 | 1,458,982 | 1,305,514 | 1,564,556 | 1,686,625 | 1,665,235 | 1,400,149 | 1,521,836 |
| (2) | Estimated Ammonia & Limestone Expense [\$] | 980,868 | 1,401,332 | 1,441,756 | 1,629,380 | 2,094,096 | 2,094,241 | 1,793,250 | 1,806,565 |
| (3) | Estimated NOx Expense [\$] | 0 | 0 | 142,662 | 177,765 | 209,846 | 204,977 | 162,392 | 0 |
| (4) | Estimated Environmental Sales [\$] | (352,950) | (555,920) | (580,464) | (204,714) | (164,995) | (168,978) | (335,835) | (373,683) |
| (5) | Estimated Total Environmental Expense [\$] | 2,090,170 | 2,304,393 | 2,309,469 | 3,166,987 | 3,825,572 | 3,795,475 | 3,019,956 | 2,954,718 |
| (6) | Estimated SC Allocation Factor of Total Expense | 0.12100 | 0.12363 | 0.12363 | 0.12363 | 0.12363 | 0.12363 | 0.12363 | 0.12363 |
| (7) | SC Share of Total Environmental Expense [\$] | 252,911 | 284,892 | 285,520 | 391,535 | 472,955 | 469,235 | 373,357 | 365,292 |
| (8) | Amount Billed to SC Customers [\$] | \$103,528 | \$107,936 | \$114,105 | \$134,130 | \$542,285 | \$527,056 | \$449,647 | \$388,795 |
| (9) | Over (Under) Recovery [\$] | (\$149,383) | (\$176,956) | (\$171,415) | (\$257,405) | \$69,330 | \$57,821 | \$76,290 | \$23,503 |
| (10) | Cumulative Under Recovery [\$] | (\$1,334,296) | (\$1,511,252) | (\$1,682,667) | (\$1,940,071) | (\$1,870,742) | (\$1,812,920) | (\$1,736,630) | (\$1,713,127) |

| Line | | Nov-08 | Dec-08 | Jan-09 | Feb-09 | Mar-09 | Apr-09 | May-09 | Jun-09 |
|------|---|---------------|---------------|---------------|-------------|-------------|-------------|-------------|-----------|
| (1) | Estimated SO2 Expense [\$] | 936,824 | 1,232,420 | 808,016 | 718,855 | 852,865 | 896,778 | 706,371 | 770,553 |
| (2) | Estimated Ammonia & Limestone Expense [\$] | 1,573,798 | 1,733,577 | 1,876,524 | 1,710,457 | 1,958,672 | 1,697,382 | 2,077,076 | 2,033,856 |
| (3) | Estimated NOx Expense [\$] | 0 | 0 | 0 | 0 | 0 | 0 | 56,877 | 61,346 |
| (4) | Estimated Environmental Sales [\$] | (479,511) | (357,618) | (800,089) | (566,395) | (989,672) | (1,401,845) | (1,591,923) | (439,464) |
| (5) | Estimated Total Environmental Expense [\$] | 2,031,111 | 2,608,379 | 1,884,451 | 1,862,917 | 1,821,865 | 1,192,315 | 1,248,401 | 2,426,291 |
| (6) | Estimated SC Allocation Factor of Total Expense | 0.12363 | 0.12363 | 0.12363 | 0.12363 | 0.12363 | 0.12363 | 0.12363 | 0.12363 |
| (7) | SC Share of Total Environmental Expense [\$] | 251,106 | 322,474 | 232,975 | 230,312 | 225,237 | 147,406 | 154,340 | 299,962 |
| (8) | Amount Billed to SC Customers [\$] | \$391,061 | \$503,795 | \$555,845 | \$448,608 | \$441,592 | \$381,054 | \$405,244 | \$482,633 |
| (9) | Over (Under) Recovery [\$] | \$139,955 | \$181,321 | \$322,870 | \$218,296 | \$216,355 | \$233,648 | \$250,904 | \$182,671 |
| (10) | Cumulative Under Recovery [\$] | (\$1,573,172) | (\$1,391,851) | (\$1,068,981) | (\$850,686) | (\$634,331) | (\$400,683) | (\$149,778) | \$32,892 |

PROGRESS ENERGY CAROLINAS, INC.

SOUTH CAROLINA RETAIL FUEL CASE - DOCKET 2008-1-E
CALCULATION OF TOTAL FUEL COMPONENT
For the Year Ending June 30, 2009

| <u>Line</u> | <u>Class</u> | <u>Cents / KWH</u> | | |
|-------------|------------------------------|--|--|--|
| | | <u>Base Fuel Cost Component</u> <u>(from Exhibit No. 6)</u> | <u>Environmental Fuel Cost Component</u> <u>(from Exhibit No. 10)</u> | <u>Total Fuel</u> <u>Costs Factor</u> |
| (1) | Residential | 3.1510 | 0.11466 | 3.2657 |
| (2) | General Service (non-demand) | 3.1510 | 0.12507 | 3.2761 |
| (3) | General Service (demand) | 3.1510 | 0.00000 [1] | 3.1510 |
| (4) | Lighting | 3.1510 | 0.00000 | 3.1510 |

[1] The environmental rate for these customers is 26 cents per kW as shown on Exhibit No. 10.

**PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA
DOCKET NO. 2008-1-E
DIRECT TESTIMONY OF
PROGRESS ENERGY CAROLINAS, INC.**

WITNESS DEWEY S. ROBERTS II

1 **Q. Mr. Roberts will you please state your full name, occupation, and address?**

2 **A.** My name is Dewey S. Roberts II (Sammy). I am employed by Progress Energy
3 Carolinas, Inc. (PEC) as Manager – Power System Operations in the System
4 Planning and Operations Department. My business address is 3401 Hillsborough
5 St, Raleigh, North Carolina.

6 **Q. Please summarize briefly your educational background and experience.**

7 **A.** I graduated from North Carolina State University in 1987 with a B.S. Degree in
8 Electrical Engineering. I also obtained a Master of Science Degree in Electrical
9 Engineering from North Carolina State University in 1990 and a Master of Business
10 Administration Degree from North Carolina State University in 2004. I am a
11 member of the Institute of Electrical and Electronics Engineers (IEEE). I am also a
12 registered Professional Engineer in the state of North Carolina and I am recognized
13 as a Certified System Operator by the North American Electric Reliability Council.
14 I joined the Company in 1990 and have held several engineering and management
15 positions in Nuclear Engineering, Engineering and Technical Services, System
16 Operator Training, Portfolio Management, Transmission Services, and Power
17 System Operations. These positions include: Project Engineer, Manager -
18 Transmission Services, and Manager-Power System Operations. In November
19 2003, I assumed the position of Manager – Power System Operations in the Power

1 System Operations Section of Progress Energy Carolinas, Inc. System Planning and
2 Operations Department. In my current position as Manager-Power System
3 Operations, I am responsible for managing the safe, reliable, economic, and
4 NERC/FERC and environmentally compliant operations for the Progress Energy
5 Carolinas' eastern and western control area power systems.

6 **Q. What is the purpose of your testimony here today?**

7 **A.** The purpose of my testimony is to review the operating performance of the
8 Company's nuclear, fossil, combined cycle, combustion turbine, and hydroelectric
9 generating facilities during the period of April 1, 2007 through March 31, 2008 and
10 demonstrate that PEC prudently operated its system for the period under review.

11 **Q. Describe the types of generating facilities owned and operated by the**
12 **Company.**

13 **A.** The Company owns and operates a diverse mix of generating facilities consisting of
14 four (4) hydro plants, forty seven (46) combustion turbines, three (3) combined
15 cycle units, nineteen (19) fossil steam generating units, and four (4) nuclear units.

16 **Q. Why does the Company utilize such a diverse mix of generating facilities?**

17 **A.** Each type of facility has different operating and installation costs and is generally
18 intended to meet a certain type of loading situation. In combination, the diversity of
19 the system, in conjunction with power purchases made when doing so is more cost-
20 effective than using a Company owned generating unit, allows the Company to
21 meet the continuously changing customer load pattern in a reasonable, cost-
22 effective manner. The combustion turbines, which have relatively low installation
23 costs but higher operating costs, are intended to be operated infrequently. They

1 also provide resources that can be started in a relatively short time for emergency
2 situations. In contrast, the large coal and nuclear steam generating plants have
3 relatively high installation costs with lower operating costs, and are intended to
4 operate in a manner to meet the constant level of demand on the system. Based on
5 the load level that the Company is called on to serve at any given point in time, the
6 Company selects the combination of facilities which will produce electricity in the
7 most economical manner, giving due regard to reliability of service and safety. This
8 total cost optimization approach provides for overall minimization of the total cost
9 of providing service.

10 **Q. Please elaborate on the intended use of each type of facility the Company uses**
11 **to generate electricity.**

12 **A.** As a general rule, peaking resources such as combustion turbines, are constructed
13 with the intention of running them very infrequently, i.e., only during peak or
14 emergency conditions. Combustion turbines are very effective in providing reserve
15 capacity because they can be started quickly in response to a sharp increase in
16 customer demand, without having to continuously operate the units. Intermediate
17 facilities are intended to operate in a load following manner with periodic startups.
18 They are best utilized to respond to the more predictable system load patterns
19 because the intermediate facilities take some time to bring on-line from a cold shut
20 down state. Additionally, these plants, located across the Company's service
21 territory, contribute to overall system reliability. The Company's intermediate
22 facilities are predominately our older coal-fired plants and gas-fired combined cycle
23 unit. They generally operate in a load following mode, being ramped up and

1 ramped down to meet system needs. Baseload facilities are intended and designed
2 to operate on a near continuous basis with the exception of outages for required
3 maintenance, modifications, repairs, major overhauls, or for refueling in the case of
4 nuclear plants. The Company's four nuclear units and five Person County coal units
5 constitute the Company's baseload facilities.

6 **Q. How much electricity was generated by each type of Company generating unit**
7 **in the 12 month period ending March 31, 2008?**

8 **A.** For the twelve-month period ending March 31, 2008, the Company generated
9 63,735,149 megawatt hours of electricity. Nuclear plants generated 44.56%, fossil
10 plants generated 50.25%, combined cycle and combustion turbine units generated
11 4.60%, and hydroelectric units generated 0.59% of the total amount of electricity
12 generated.

13 **Q. How does the Company ensure that it operates these types of generating**
14 **facilities as economically as possible?**

15 **A.** The Company has a central Energy Control Center which monitors the electricity
16 demands within our service area. The Energy Control Center regulates and
17 dispatches available generating units in response to customer demand in a least cost
18 manner. Sophisticated computer control systems match the changing load with
19 available sources of power. Personnel at the Energy Control Center, in addition to
20 being in contact with the Company's generating plants, are also in communication
21 with other utilities bordering our service territory. In the event a plant is suddenly
22 forced off-line, the interconnections with neighboring utilities help to ensure that
23 service to our customers will go uninterrupted. Additionally, the interconnections

1 allow us access to the unloaded capacity of neighboring utilities so that our
2 customers will be served by the lowest cost power available through inter-utility
3 purchases.

4 **Q. How does the Company determine when it needs to purchase power?**

5 **A.** The Company is constantly reviewing the power markets for purchase
6 opportunities. We buy when there is reliable power available that is less expensive
7 than the marginal cost of all available resources to the Company. This review of
8 the power markets is done on an hourly, daily, weekly, monthly basis. Also, with
9 regard to long term resource planning, we always evaluate purchased power
10 opportunities against self build options.

11 **Q. During the review period April 1, 2007 through March 31, 2008, did the**
12 **Company prudently operate its generating system within the guidelines**
13 **discussed in regard to the three types of facilities?**

14 **A.** Yes. Two different measures are utilized to evaluate the performance of generating
15 facilities. They are equivalent availability factor and capacity factor. Equivalent
16 availability factor refers to the percent of a given time a facility was available to
17 operate at full power if needed. Capacity factor measures the generation a facility
18 actually produces against the amount of generation that theoretically could be
19 produced in a given time period, based on its maximum dependable capacity.
20 Equivalent availability factor describes how well a facility was operated, even in
21 cases where the unit was used in a load following application. Our combustion
22 turbines averaged 93.24% equivalent availability and a 5.75% capacity factor for
23 the twelve-month period ending March 31, 2008. These performance indicators are

1 consistent with the combustion turbine generation intended purpose. The
2 generation was almost always available for use, but operated minimally. Our
3 intermediate gas-fired combined cycle unit averaged 90.43% equivalent availability
4 and a 35.56% capacity factor for the twelve-month period ending March 31, 2008.
5 Again, this level of operation is consistent with the facility's intended purpose, that
6 being a load following position after our intermediate fossil plants. Our
7 intermediate (or cycling) coal fired units, had an average equivalent availability
8 factor of 88.93% and a capacity factor of 63.89% for the twelve-month period
9 ending March 31, 2008. Again, these performance indicators are indicative of good
10 performance and management for intermediate, load following facilities. Our fossil
11 baseload units had an average equivalent availability of 89.78% and a capacity
12 factor of 73.45% for the twelve-month period ending March 31, 2008. Thus, the
13 fossil baseload units were also well managed and operated. For the twelve-month
14 period ending March 31, 2008, the Company's nuclear generation system achieved
15 an actual capacity factor of 92.78%. Excluding outage time associated with
16 reasonable outages, such as refueling, the nuclear generation system's net capacity
17 factor for this period rises to 101.7%. Therefore, pursuant to S.C. Code Ann. § 58-
18 27-865(F), since the adjusted capacity factor exceeds 92.5%, the Company is
19 presumed to have made every reasonable effort to minimize the cost associated
20 with the operation of its nuclear generation.

21 **Q: How did the performance of the Company's nuclear system compare to the**
22 **industry average?**

1 **A:** As mentioned in the response to the previous question, during the period April
2 1, 2007 through March 31, 2008, the Company's nuclear generation system
3 achieved an actual capacity factor of 92.78%. In contrast, the NERC five-year
4 average capacity factor for 2002-2006 for all commercial nuclear generation in
5 North America was 87.90%. The Company's nuclear system incurred a 0.67%
6 forced outage rate during the twelve-month period ending March 31, 2008
7 compared to the industry average of 4.21%. These performance indicators reflect
8 good nuclear performance and management for the review period.

9 **Q. How did the Company's fossil units perform as compared to the industry?**

10 **A.** Our entire fossil steam generation fleet operated well during the 12 months ending
11 March 31, 2008, achieving an equivalent availability factor of 88.04% for this
12 period. This performance indicator exceeds the most recently published NERC
13 average equivalent availability for coal plants of 85.05%. The NERC average
14 covers the period 2002-2006 and represents the performance of 905 coal-fired units.
15 Equivalent availability is a more meaningful measure of performance for coal
16 plants than capacity factor because the output of our fossil units varies significantly
17 depending on the level of system load. For the twelve-month period ending March
18 31, 2008, our baseload fossil units, Mayo Unit 1, and Roxboro Units 1, 2, 3, and 4,
19 operated at equivalent availabilities of 96.24%, 89.97%, 86.90%, 92.07%, and
20 83.69% respectively. Roxboro 2 and Roxboro 4 have relatively lower equivalent
21 availabilities due to major turbine outages and scrubber installations that occurred
22 in the spring 2008 and fall 2007, for each unit respectively.

1 As I mentioned earlier, the baseload coal units achieved an average equivalent
2 availability of 89.78%. These performance indicators compare well with the
3 industry weighted average equivalent availability factor of 84.83% for 177
4 similarly sized fossil units.

5 **Q. How did the Company's hydroelectric units perform during the review**
6 **period?**

7 **A.** The usage of the hydro facilities on the Company's system is limited by the
8 availability of water that can be released through the turbine generators. The
9 Company's hydro plants have very limited ponding capacity for water storage. The
10 Company operates the hydro plants to obtain the maximum generation from them;
11 but because of the small water storage capacity available, the hydro units have been
12 primarily utilized for peaking and regulating purposes. This operation maximizes
13 the economic benefit of the units. The hydroelectric units had an equivalent
14 availability of 95.42% and operated at a capacity factor of 18.83% for the twelve-
15 month period ending March 31, 2008. The 5 year industry average for
16 hydroelectric generation as published in NERC's most recent report reflects an
17 average equivalent availability of 88.41% and an average capacity factor of
18 42.00%. These performance indicators show that the Company managed the
19 hydroelectric facilities well, keeping them almost always available for economic
20 use when water was available. The low capacity factor for the Company's
21 hydroelectric facilities reflects the exceptional drought conditions experienced
22 across the Company's system during the review period. However, hydroelectric
23 facility generation comprises only a small amount of the total energy generated for

1 the Company's system needs. For the 2005-2006, 2006-2007, and 2007-2008
2 review periods, the Company's hydroelectric generation facilities generated 1.14%,
3 1.01%, and 0.59% of the total energy generated by the Company's system.

4 **Q. Are you presenting any exhibits with your testimony?**

5 **A.** Yes. Roberts Exhibit No. 1 is a graphic representation of the Company's generation
6 system operation for the twelve-month period ending March 31, 2008.

7 **Q. Did the Company prudently operate and dispatch its generation resources**
8 **during the period April 1, 2007 through March 31, 2008 in order to minimize**
9 **its fuel costs?**

10 **A.** Yes.

11 **Q. Does this conclude your testimony?**

12 **A.** Yes.

13

14 213191

**Comparison of Progress Energy Carolinas
Installed Generating Capacity
to Actual Generation Mix
April 1, 2007 through March 31, 2008**

